

Notice of Allowability

Application No.

10/607,553

Examiner

Courtney Thomas

Applicant(s)

CLAUS ET AL.

Art Unit

2882

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 6/25/03.
2. ☒ The allowed claim(s) is/are 1-25.
3. ☒ The drawings filed on 25 June 2003 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---|--|
| 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. |
| 3. <input checked="" type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date <u>6/25/03</u> | 7. <input type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |

DETAILED ACTION

Allowable Subject Matter

1. Claims 1-25 are allowed.
2. The following is an examiner's statement of reasons for allowance:
3. **As per claims 1, 14, 23, 24 and dependent claims 2-4 and 15-22**, the examiner found no reference in the prior art that disclosed or made obvious a method (and system) of reconstructing 3-dimensional information of an object comprising the step of determining mathematical relationships between sinusoidal components of logical slices through the object with sinusoidal components of projection images of the object as recited in independent claims 1, 14, 23 and 24.
4. **As per claim 5 and dependent claims 6-9**, the examiner found no reference in the prior art that disclosed or made obvious a method of reconstructing 3-dimensional images of an object based on 2-dimensional data of the object detected by a digital tomosynthesis system comprising the steps of determining a mathematical relationship between Fourier coefficients and vertical profiles of Fourier coefficients at corresponding frequencies; determining an optimal vertical profile for each frequency by determining a linear combination of certain characteristic vertical profiles associated with that frequency and the focal spot locations which is a best approximation of the vertical profile of the Fourier coefficients at corresponding frequencies; for each height above the detector and within the object, collecting the Fourier coefficients of all frequencies at the height by determining the values of the corresponding optimal vertical profiles at the height; for each height, determining the inverse Fourier Transform of the Fourier coefficients; and

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reconstructing the 3-dimensional image of the object by collecting the results of the inverse Fourier Transform in a volumetric stack of reconstructed slices as recited in independent claim 5.

5. **As per claim 10 and dependent claims 11-13**, the examiner found no reference in the prior art that disclosed or made obvious a method of imaging an object by a digital tomosynthesis system comprising the step of reconstructing 3-dimensional images of the object based upon the phases and amplitudes of sinusoidal components of projection images as recited in independent claim 10.

6. **As per claim 25**, the examiner found no reference in the prior art that disclosed or made obvious a method of reconstructing 3-dimensional information of an object from projection images acquired by a digital tomosynthesis system comprising the steps of: determining mathematical relationships between Fourier transforms of logical slices through the object at predetermined frequencies with Fourier transforms of projected images of the object at said predetermined frequencies; reconstructing 3-dimensional information about the object at said predetermined frequencies from 2-dimensional information about the object included in the projection images detected by the detector for different focal spot positions of the x-ray source; and reconstructing 3-dimensional information about the object at frequencies other than said predetermined frequencies using a non-Fourier transform reconstruction technique, as recited in independent claim 25.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

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Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Courtney Thomas whose telephone number is (571) 272-2496. The examiner can normally be reached on M - F (9 am - 5 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on (571) 272 2490. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Courtney Thomas CT
Examiner
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DAVID V. BRUCE
PRIMARY EXAMINER